

**FUTURE FISHERIES IMPROVEMENT PROGRAM  
GRANT APPLICATION**

*(please fill in the highlighted areas)*

**I. APPLICANT INFORMATION**

- A. Applicant Name: Jim Olsen
- B. Mailing Address: 313 Galaxy Dr
- C. City: Butte State: MT Zip: 59701
- Telephone: 533-8451
- D. Contact Person: Same as above
- Address if different from Applicant: \_\_\_\_\_
- City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_
- Telephone: \_\_\_\_\_
- E. Landowner and/or Lessee Name  
(if other than Applicant): State of Montana FWP
- Mailing Address: \_\_\_\_\_
- City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_
- Telephone: \_\_\_\_\_

**II. PROJECT INFORMATION\***

- A. Project Name: California Creek Hill Slope Revegetation
- River, stream, or lake: California Creek
- Location: Township 3N Range 11W Section 16
- County: Deerlodge
- B. Purpose of Project:  
Revegetate slopes affected by the Anaconda Smelter fallout to reduce sediment and metals loading to California Creek.
- C. Brief Project Description: \_\_\_\_\_

California Creek is a tributary to French Creek which drains into Deep Creek, and then into the Big Hole River (Figure 1). The stream is for the most part a low gradient meandering "C" type channel with a densely willowed, and well developed floodplain. Deep Creek and its tributaries are home to several imperiled aquatic species including Arctic grayling, westslope cutthroat trout and western pearlshell mussels. Extensive mining related activities, grazing and fallout from the Anaconda Smelter have had significant effects on the aquatic and riparian habitat in California Creek over much of the

past century. The most significant and longest lasting of these impacts has been the fallout from the smelter. Elevated levels of copper and arsenic and low pH caused soil conditions that could not support plant life. Further, much of the area was logged in the early 1900's for fuel wood to fire the smelter and for mining stulls. Significant gullies and rills have formed due to the lack of vegetation present on the steep, impacted slopes of Sugarloaf Mountain near the headwaters of California Creek (Figure 2, 3 and 4). Because of the high elevation and large snowpack present in most years at this elevation, there is significant annual runoff from these slopes. As these gullies and rills converge, large down cuts have formed which have further exacerbated the erosion (Figure 4). Large plumes of sediment have entered California Creek as these gullies converge with stream (Figure 5). Further, these deltas are crossing public roads causing issues with maintaining access to public lands on the Mount Haggin Wildlife Management Area.

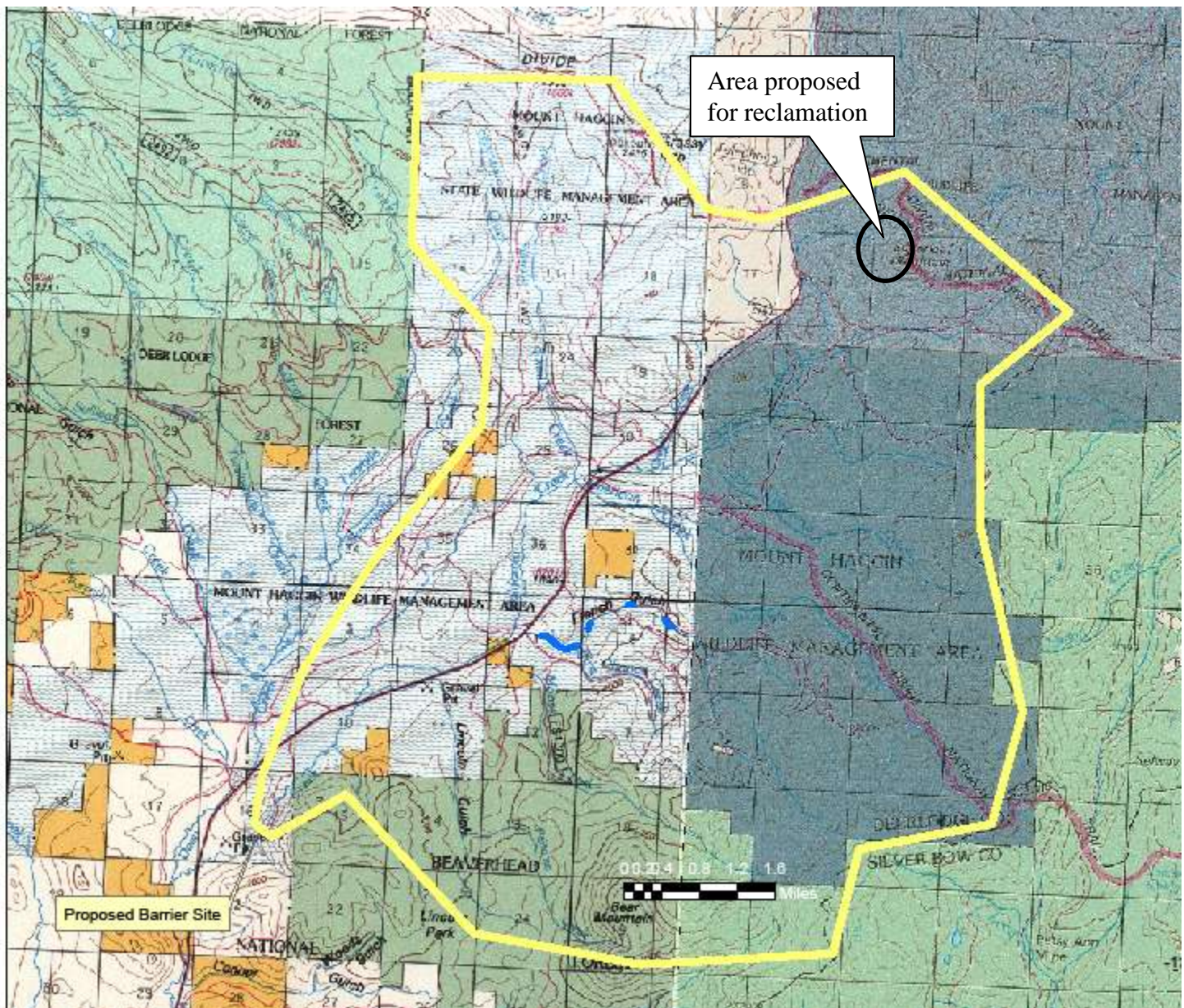


Figure 1. French Creek watershed including headwaters of California Creek (circled).



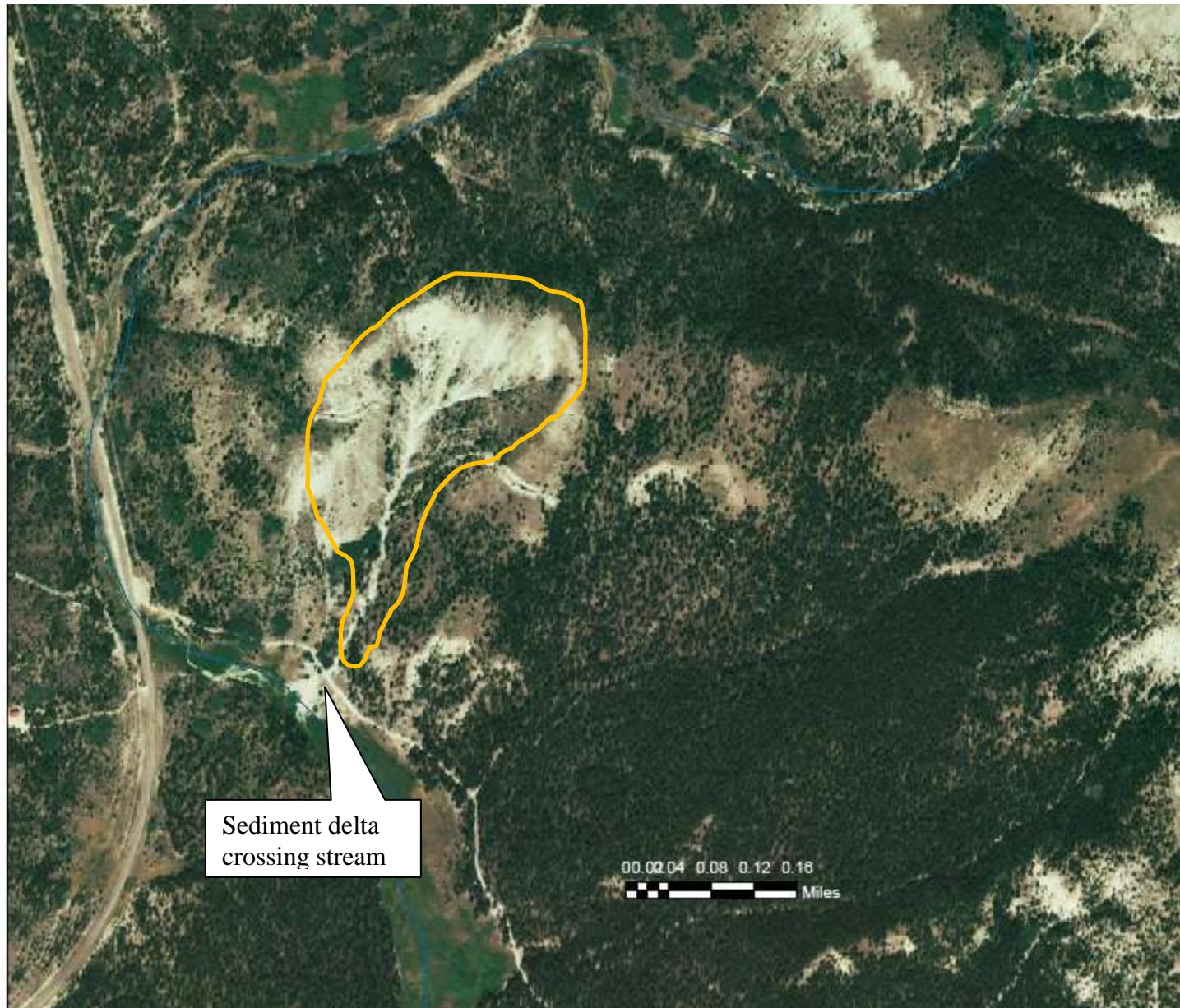


Figure 2. Aerial photo of area small watershed proposed for restoration.

Land management practices put in place once FWP acquired the Mount Haggin property in 1976 have resulted in overall improved riparian and hill slope habitat conditions. Willows which were noted as sparse 30 years ago in California Creek are now abundant and livestock grazing, which was listed as a significant contributor to bank instability and sediment input in the early 1980's, has been controlled through a rest-rotation grazing program. Some areas of Sugarloaf Mountain have revegetated and stabilized. However, many of the steeper south facing slopes have been slow to heal. Despite significant improvements in riparian health, California Creek is still overburdened by fine, metal laden sediment from unstable hill slopes, which has resulted in substantial impacts to aquatic life and listing by DEQ as impaired for both metals and sediment.





Figure 3. Denuded vegetation on steep slopes of Sugarloaf Mountain (in background).



Figure 4. Deep gully where drainage from unvegetated upslopes converge.



Figure 5. Delta of sediment discharging directly to an unnamed tributary to California Creek

As part of the settlement agreement between ARCO and the State of Montana, a portion of funding was set aside for revegetation of the smelter affected areas including Mount Haggin Wildlife Management Area (\$13.2 million). Unfortunately, under the current process none of this funding can be spent east of the Continental Divide, even though the damage is clearly smelter related. A study was initiated in 2010 by Watershed Consulting Inc. to develop techniques for restoring the steep slope areas of Cabbage Gulch west of the divide. This report outlined techniques that were tested and evaluated since 2010 to reducing erosion of contaminated sediments off steep slopes and restoring the ecological integrity of the damaged area. The report demonstrated two main ways to reduce sediment movement – either retain it where it is on the hillside or catch it on the landscape before it reaches the stream. Four main strategies were employed: 1) tree and shrub planting; 2) grass seeding; 3) erosion control structures; and 4) plant protection in areas of natural regeneration. Monitoring was done with each strategy to measure its effectiveness. Because of the similarity in site conditions, mechanisms of resource damage, and objectives for restoration, results from Watershed Consulting’s efforts west of the divide have been used to inform work being proposed in the California Creek project area.

The proposed revegetation and erosion control work for this project is to be conducted on a small unnamed tributary to California Creek, on the south-facing slopes of Sugarloaf Mountain, on Mount Haggin Wildlife Management Area (Figure 2). The objectives of the

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project are to: 1) reduce movement of soils off steep slopes by revegetating bare areas and promoting growth and vigor of naturally regenerating vegetation; and 2) stabilize the rills and gullies in the upper basin and create small catchments to slow sediment delivery.

For the first objective, we will employ two main techniques: 1) create “islands” of planted grasses, trees and shrubs; and 2) erect wildlife exclosures around naturally regenerating plant clusters to provide protection from browsing.

#### Vegetation Islands on Up Slope Areas

The intent of this technique is to create islands of vegetation within the eroding areas that will act as sediment traps and expand to non-treated areas to eventually stabilize the entire slope. Ten 15'x 35' plots will be located on bare soil areas on the upper portion of the project area. Each plot will be fenced with heavy duty plastic fencing to provide protection from wildlife browsing and to catch and hold snow. Plot areas will be re-graded and contoured in such a way to flatten the surface in order to trap and stabilize loose soils and create better site conditions for plant growth. On-site material (woody debris, rocks) will also be used to trap and hold sediments and moisture around each plot. Each island will be divided into 3 equal sections and will receive one of 3 treatments: fertilizer and lime only; fertilizer, lime and compost; fertilizer, lime and local inoculants (from plant duff). Application rates for lime will be determined by collecting 4-10 soil samples per “island” and compositing these samples to determine the pH and appropriate application rate specific to each island. Each of the 3 treatment areas will be planted with the same number and species of plants. These will include grass (bluebunch-, slender-, and thickspike wheatgrass); shrubs (rose and chokecherry); and trees (aspen and lodgepole). Grass will be from plugs rather than seed since previous work has shown that growth of plugs is more effective than germination of seeds. These plots would be focused at the headwaters of the drainage where the slopes are flatter and there is less gulling. Each treatment within each island will be monitored for plant survival and plant vigor. In addition, photo plots will be established at each island to monitor change over time. Cost for each island is approximately: \$1,200 (includes materials, plantings, soil pH testing, and soil amendments).

#### Natural Regeneration Protection

Within the project area are several areas where vegetation has been naturally regenerating but has been impacted by wildlife browsing. In order to allow for maximum growth and vigor of these plant clusters, we propose erecting wildlife exclosures around these clusters to provide protection from browse and help trap sediments and moisture. Exclosures will be built either with on-site wooden stakes or 7' T posts, then wrapped with heavy duty plastic fencing. The tops of the nets will be closed off by winding rope through the net and tying the ends together. Photo points will be established at each exclosure to monitor their effectiveness. Cost for each exclosure: \$200. We expect to erect 10 exclosures. Total cost: \$2,000.

#### Rills and Gullies on Mid and Lower Slope Areas:

The major rills and gullies will be treated by hand excavating material from the side slopes and placing this material in the rills and gullies to alter their morphology from a “V” shape to more a “U” shape to facilitate moisture and soil retention and aid in

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replanting success. The valley of the gully will be coated with mulch and covered in fabric (slopes steeper than 2:1 coconut fiber and slopes less than 2:1 coconut/straw mat). Small sediment basins will be constructed in the gullies with an 8-12-inch high lip placed at the downstream end of the basin to retain some of the sediment generated from upstream. These basins will be made using local materials and the lip and will be covered with fabric. They will be shaped such that they are lowest in the center of the gully and highest as it ties into the side slopes in a slight “U” shape to focus surface flows to the center of the gully.

One technique that was found to be successful in the 2007 report was the use of what were called “dozer basins” which consist of a hole gouged in the ground with a bull dozer that was perpendicular to the slope of the basin and often parallel to steep gullies. These dozer basins allowed water to settle in the basin and organic material to collect and were successful at establishing permanent vegetation. We are proposing the same concept adjacent to steeper rills but on a smaller scale through the use of overlapping hand-dug pits roughly 8 x 8 ft and about a foot deep with the excavated fill cast on the downhill side creating an 8-12 inch high berm (Figure 6). The pits and adjacent slopes will be coated with a thin layer of mulch and grass seed and covered with a coconut-straw fabric to hold in moisture and reduce the likelihood erosion. The fabric would also extend over the berm to protect against erosion should the basin be overtopped by surface runoff. The overlapping pits would resemble fish scales in appearance.

Within the 15-acre treatment zone, there are approximately 3000 ft of rills and gullies that would be treated. The “dozer” basins would require 12 8x113 ft coconut-straw mats. Approximately 50 cubic yards of mulch would be imported to the site. Where present, native sod and other herbaceous vegetation will be salvaged and reused. Local materials such logs, rocks and other debris will be incorporated into the landscape to aid in retaining moisture and soil stability and providing micro climates for plants. Lodgepole pines and other woody vegetation would be left intact. Dead or live trees from adjoining, non-eroding slopes may be harvested to be used for reclamation purposes and creating microclimate areas.

All techniques employed in this project will be performed primarily by 2, 6-person Montana Conservation Corps hand crews working for 4 weeks. ATVs and/or horses volunteered by the Mile High Backcountry Horsemen would be used to transport equipment and supplies to the work site.

A total of 15 additional areas similar to the proposed project have been identified in the upper California Creek watershed, most of which are less extensive than this proposal. While the entire damaged area in upper California Creek is extensive, this project proposes to initiate efforts to develop affordable and effective ways to stabilize and restore the upslope areas where slopes are often greater than 2:1. More specifically, this proposed restoration project will be a pilot project, and hopefully the first phase of a larger restoration effort to restore California, French and Deep Creek subwatersheds. This project will lay the foundation for future work if larger funding sources become available and will act as a pilot demonstration project to show possible partners and collaborators accomplishments of this initial work in order to seek funding sources for future restoration. It should be noted that in addition to habitat restoration in the watershed, a project is planned for native fish restoration in the drainage including Arctic grayling and westslope cutthroat trout. Currently there are no remaining populations of

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westslope cutthroat trout or grayling in the French Creek watershed but the restoration of these species to the drainage would result in over 40 miles of occupied habitat. However, habitat restoration is paramount and once commenced will greatly aid in the future recovery of native species.



Figure 6. Aerial photo showing examples of how the proposed treatments would look once completed. The blue lines represent the steeper (between 2:1 and 1:1) slopes in the gullies and the red lines represent the less steep slopes (2:1 or less). The small rectangles are the 15x35 ft “island” plots drawn to scale. The treatment shown in the center of the photo would be indicative of the “dozer” basin treatment and is not drawn to scale.

Monitoring of this project will also provide important feedback on the success and failures of the techniques used and provide a guide for other steep slope reclamation in the future. Within the small treatment area proposed in this project there are examples where vegetation has recovered and slopes have become stabilized (Figure 6). It is Revised August 5, 2009



anticipated that the work proposed in this project will result in conditions similar to this recovering area.



Figure 7. Naturally revegetated soils of phase 1 area and a representation of expected conditions once project is complete.

D. Length of stream or size of lake that will be treated: 15 acres

E. Project Budget:

**Grant Request (Dollars):** \$ 26,000

Contribution by Applicant (Dollars): \$ In-kind \$  
(salaries of government employees are not considered as matching contributions)

Contribution from other Sources (Dollars): \$ 20,000 SWG In-kind \$  
(attach verification - See page 2 budget template)

**Total Project Cost:** \$ 46,000

F. Attach itemized (line item) budget – see template

G. Attach specific project plans, detailed sketches, plan views, photographs, maps, evidence of landowner consent, evidence of public support, and/or other information necessary to evaluate the merits of the project. If project involves water leasing or water salvage complete supplemental questionnaire ([fwp.mt.gov/habitat/futurefisheries/supplement2.doc](http://fwp.mt.gov/habitat/futurefisheries/supplement2.doc)).

H. Attach land management and maintenance plans that will ensure protection of the reclaimed area. A land management agreement is required for all westslope cutthroat projects in FWP Region 3 that occur on public lands prior to project initiation and will be completed at the time the EA is completed.

### III. PROJECT BENEFITS\*

A. What species of fish will benefit from this project?:

Currently brook trout, mountain whitefish, longnose suckers but eventually westslope cutthroat trout and Arctic grayling

B. How will the project protect or enhance wild fish habitat?:

The project will reduce the sediment loading to California Creek which will benefit all aquatic life including fish, insects and pearlshell mussels. California Creek is listed as impaired by Montana DEQ for fine sediment and metals

C. Will the project improve fish populations and/or fishing? To what extent?:

The project will aid in improving the fishery in California Creek by reducing sediment loading which will increase egg survival and increase aquatic invertebrate productivity. It will also reduce fine sediment loading and metals in Deep Creek and the Big Hole River.

D. Will the project increase public fishing opportunity for wild fish and, if so, how?:

California Creek is very accessible to anglers. Nearly the entire watershed is on the Mount Haggin Wildlife Management Area. The habitat in California Creek is very good with abundant pools and common beaver dams. If the fine sediment loading were reduced, the fishery could be improved substantially which would increase fishing opportunities.

E. If the project requires maintenance, what is your time commitment to this project?:

The project should not require long-term maintenance once permanent vegetation becomes established.

F. What was the cause of habitat degradation in the area of this project and how will the project correct the cause?:

The cause of habitat degradation in this area is fallout from the Anaconda smelting operations.

G. What public benefits will be realized from this project?:

The public benefit of the project is improvements in water quality and fisheries in California Creek. Further, the upslope restoration will improve terrestrial habitat and will serve as pilot project for future restoration.

H. Will the project interfere with water or property rights of adjacent landowners? (explain):

No. FWP owns all the property where work is proposed

I. Will the project result in the development of commercial recreational use on the site?: (explain):

No.

J. Is this project associated with the reclamation of past mining activity?:



Yes

**Each approved project sponsor must enter into a written agreement with the Department specifying terms and duration of the project.**

**IV. AUTHORIZING STATEMENT**

I (we) hereby declare that the information and all statements to this application are true, complete, and accurate to the best of my (our) knowledge and that the project or activity complies with rules of the Future Fisheries Improvement Program.

Applicant Signature:

Date:

Sponsor (if applicable):

**\*Highlighted boxes will automatically expand.**

**Mail To: Montana Fish, Wildlife & Parks  
Habitat Protection Bureau  
PO Box 200701  
Helena, MT 59620-0701**

**Incomplete or late applications will be returned to applicant.**

**Applications may be rejected if this form is modified.**

**\*\*\*Applications may be submitted at anytime, but must be received by the Future Fisheries Program office in Helena before December 1 and June 1 of each year to be considered for the subsequent funding period.\*\*\***